REMARKS

Applicants note with appreciation the indication of allowable subject matter by the Examiner, specifically, the subject matter recited in Claims 7 and 25. Now in the application are Claims 1-30 of which Claims 1, 13, and 19 are independent. The following comments address all stated grounds for rejection and place the presently pending claims as identified above, in condition for allowance.

CLAIM REJECTIONS UNDER 35 U.S.C. §102

Claims 1-5, 9-11, 13, 14, 16-24, and 27-29 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,832,222 of Dziadosz, *et al.* (hereinafter "Dziadosz"). Applicants respectfully traverse each of these rejections. For purposes of clarity in the discussion below, the respective related Claim sets are discussed separately.

I. Rejection of Claims 1-5 and 9-11 under 35 U.S.C. §102(b)

Claims 1-5 and 9-11 are directed to a method that is practiced in a storage network. Performance of the method updates a first replica held by a physically remote storage device in the storage network. The method includes steps of instructing a first data replication facility of a first electronic device in the storage network to log one or more writes to a local storage device when the first replica held by the physically remote storage device cannot be updated due to a detected error condition in the storage network. In accordance with the recited method, the first electronic device further determines if the detected error condition still exists in the storage network that prevents updating of the first replica held by the physically remote storage device. The method further includes a step of instructing the first data replication facility of the first electronic device to replicate data corresponding to the one or more writes identified in the log to generate a second replica upon the determination by the first electronic device that the first replica held by the physically remote storage device can be updated due to a removal of the

detected error condition. The second replica is outputted by the first electronic device in accordance with a communication protocol to a second data replication facility of a second electronic device of the physically remote storage device in the storage network to update the first replica.

The Dziadosz reference does not anticipate Claims 1-5 and 9-11. The Dziadosz reference is directed to a computer system having a scalable software architecture. The scalable software architecture of Dziadosz is a kernel level communication architecture which transparently connects I/O subsystems together by communicating state information and I/O request data across a network to geographically dispersed processing units that cooperate to perform a distributed computer system. The disclosed kernel level of communication architecture operates in different operating systems to scale and expand a local node across multiple nodes.

Dziadosz is concerned with monitoring the operational state of an application program that is executing on a processing unit. That is, Dziadosz is concerned with maintaining an application program operating in an active mode or has an active state. Dziadosz employs switch over software executing on a remote processing unit to monitor the operational status of a local processing unit across a network to insure that the local processing unit remains in an operative state. If the local, or active, processing unit fails in some respect, the switch over software on the remote or standby processing unit detects such failure on the active processing unit and switches execution of its application to the remote processing unit to address the failed processing unit.

The switch over software when used in conjunction with a distributed data model software provides the software architecture of the Dziadosz reference with the capability of (1) detecting when a geographically dispersed processing unit has failed in some respect; and (2) mounting a copy of the software application that was executing on the failed processing onto the resident processing unit to pick up processing of the data where the failed processing unit left off. Execution of the software application on the resident processing unit is possible because of the fact that the distributed data model software transparently replicates data from the failed processing unit to the resident processing unit in the same order written to the failed processing unit, before the failed processing unit fails.

Nowhere does the Dziadosz reference disclose a method in a storage network that includes a step of instructing a first data replication facility of a first electronic device in a the storage network to log one or more writes to a local storage device when the first replica held by the physically remote storage device cannot be updated due to a detected error condition in the storage network. The Dziadosz reference merely discloses that an application failure on a primary processing unit does not prevent access to data in a distributed system. That is, Dziadosz, upon detection of an error that effects execution of a primary application initiates execution of a secondary application program to allow multiple servers running on separate computers to access the same database files simultaneously.

The operational and functional differences between the Claimed invention and the architecture of the Dziadosz patent results in completely distinct software architectures, functions, and operations. Whereas the Claimed invention logs data upon the detection of a network failure that prevents updating of a first replica, the Dziadosz patent initiates execution of a software application, such as a DBMS application on a remote device to access data on the remote device to maintain user access to the data. Dziadosz is concerned with maintaining access to data after a failure in a distributed network. That is, Dziadosz is not concerned with maintaining a state of a replica when a failure occurs as in the method recited in Claim 1.

Hence, Claims 1-5 and 9-11 are not anticipated by Dziadosz. Accordingly, Applicants respectfully request the Examiner to reconsider and withdraw the rejection of Claims 1-5 and 9-11 under Dziadosz.

II. Rejection of Claims 13, 14 and 16-18 under 35 U.S.C. §102(b)

Claims 13, 14, and 16-18 stand rejected under 35 U.S.C. §102(b) as being anticipated by Dziadosz. Applicants respectfully traverse this rejection for the following reasons.

Claims 13, 14, and 16-18 are directed to a method to handle a communication link failure in a computer network. The computer network includes a number of programmable electronic devices, and each of the programmable electronic devices

operates as a host device for a data replication facility for replicating data amongst the programmable electronic devices. The method includes a step of instructing each data replication facility of each programmable electronic device to enter a logging routine should the host device of the data replication facility detect the communication link failure. The method further includes a step of instructing each data replication facility of each programmable electronic device that initiated the logging routine to generate a replica for each local write identified in the log upon re-establishment of the communication link.

Claims 13, 14, and 16-18 are not anticipated by Dziadosz. Dziadosz does not disclose a step of instructing each data replication facility of each programmable electronic device in a computer network to enter a logging routine should a host device of a replication facility detect a communication link failure in the computer network. Dziadosz is not concerned with maintaining the state of a replica upon determination of a failure within a computer network. That is, Dziadosz, upon detection of an error that effects execution of a primary application initiates execution of a secondary application program to allow multiple servers running on separate computers to access the same database files simultaneously. Dziadosz is concerned with maintaining access to data upon detection of a failure in a network. Accordingly, Dziadosz does not instruct a replication facility to enter a logging routine should the host of the replication facility detect a communication link failure. Rather, Dziadosz migrates data execution of an application to a new host should the primary host for an application fail in some manner to maintain a user's access to application-related data.

Accordingly, Claims 13, 14, and 16-18 are not anticipated by Dziadosz. Hence, Applicants respectfully request the Examiner to reconsider and withdraw the rejection of Claims 13, 14, and 16-18 under 35 U.S.C. §102(b).

III. Rejection of Claims 19-24 and 27-29 under 35 U.S.C. §102(b)

Claims 19-24 and 27-29 stand rejected under 35 U.S.C. §102(b) as being anticipated by Dziadosz. Applicants respectfully traverse this rejection based on the following comments.

Claims 19-24 and 27-29 are directed to a readable medium holding programmable electronic device readable instructions to perform a method in a storage network to update a first replica held by physically remote storage device in the storage network. The medium includes instructions to instruct a first data replication facility of a first programmable electronic device in the storage network to enter a first state to log one or more writes to a local storage device when the first replica held by the physically remote storage device cannot be updated due to a detected error condition that does not allow transmission of data to the physically remote storage device. The medium further includes instructions to determine at the first programmable electronic device if the first replica held by the physically remote storage device can be updated due to an abatement of the detected error condition. The medium includes instructions to instruct the first data replication facility of the first programmable electronic device to replicate data corresponding to the one or more writes identified in the log in order to create a second replica upon determination by the first programmable electronic device that the first replica held by the physically remote storage device can be updated. Further instructions held by the medium outputs the second replica in accordance with a communication protocol from the first programmable electronic device to a second data replication facility of a second programmable electronic device in communication with the physically remote storage device in the storage network to update the first replica.

Claims 2, 19-24 and 27-29 are not anticipated by Dziadosz. Dziadosz does not disclose the step of instructing a first data replication facility of a first programmable electronic device in a storage network to enter a first state to log one or more writes to a local storage device when a first replica held by a physically remote storage device cannot be updated due to a detected error condition that does not allow transmission of data to the physically remote storage device. Dziadosz is not concerned with maintaining state of a replica upon the detection of an error condition that does not allow transmission of data to a physically remote storage device. In contrast to the Claimed method, Dziadosz is concerned with maintaining execution of an application that allows a user access to application-related data upon detection of an error condition that affects the primary copy of the application. That is, Dziadosz, upon detection of an error that effects execution of a primary application initiates execution of a secondary application program

to allow multiple servers running on separate computers to access the same database files simultaneously. Nowhere does Dziadosz disclose a step of instructing a first data replication facility of a first programmable electronic device in a storage network to enter a first state to log one or more writes to a local storage device when the first replica held by a physically remote storage device cannot be updated due to a detected error condition that does not allow transmission of data to the physically remote storage device.

The function and operation of the method recited in Claims 19-24 and 27-29 are distinct from the function and operation of the architecture disclosed by Dziadosz. Hence, Dziadosz does not anticipate Claims 19-24 and 27-29. Accordingly, Applicants respectfully request the Examiner to reconsider and withdraw the rejection of Claims 19-24 and 27-29 under 35 U.S.C. §102(b).

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claims 6, 8, 12, 15, 26, and 30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Dziadosz in view of U.S. Patent No. 5,909,540 of Carter, et al. Applicants respectfully traverse each of these rejections. For purposes of clarity in the discussion below, the respective related Claim sets are discussed separately.

IV. Rejection of Claims 6, 8, and 12 under 35 U.S.C. §103(a)

Claims 6, 8, and 12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Dziadosz in view of U.S. Patent No. 5,909,540 of Carter, et al. (hereinafter "Carter"). Applications respectfully traverse this rejection in view of the following arguments.

Claims 6, 8 and 12 depend, directly or indirectly, from Claim 1 and, hereby, incorporate the novel features of independent Claim 1. As discussed above, in connection the Claim rejections under 35 U.S.C. §102, the Dziadosz patent does not anticipate Claim 1.

The Carter patent is directed to a network having an interface to a globally addressable memory system that provides persistent storage of data exchange

connectivity information. The exchange connectivity information provides information regarding node failures to other nodes in the network, and the surviving nodes use the information to determine which node, if any, has ceased functioning. Various processes are used to recover the portion of the global address space for which the failure node was responsible, including RAM directory, DIS directory, or file system information.

The Carter reference is not concerned with data replication. In fact, the Carter reference teaches away from data application. *See,* column 2, line 52-64 of Carter. Hence, the Carter reference fails to bridge the factual deficiencies of the Dziadosz reference, and accordingly, neither the Dziadosz nor the Carter reference, alone or in combination, teach or suggest each and every element recited in Claims 6, 8, and 12.

The Dziadosz reference, in view of the Carter reference, fails to establish a *prima facie case* of obviousness with which to reject Claims 6, 8 and 12. Neither the Dziadosz reference nor the Carter reference, alone or in combination, teach or suggest each and every element of the rejected Claims. Moreover because Carter teaches away from replication, there is no suggestion or motivation to combine the two references. Hence, Claims 6, 8, and 12 are not obviated by Dziadosz or by Carter, alone or combination. Applicants therefore respectfully request the Examiner to reconsider and withdraw the rejection of Claims 6, 8, and 12 under 35 U.S.C. §103.

V. Rejection of Claim 15 under 35 U.S.C. §103(a)

Claim 15 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Dziadosz in view of Carter. Applicants respectfully traverse this rejection in view of the comments below.

Claim 15 depends directly, or indirectly, from independent Claim 13 and, thereby, incorporates the novel features of Claim13.

Claim 15 is not rendered unpatentable over Dziadosz in view of Carter. As discussed above, in connection with the rejection of Claim 13 under 35 U.S.C. §102, Dziadosz does not disclose each and every element of Claim 13.

The Carter reference is not concerned with data replication. In fact, the Carter reference teaches away from data application. *See,* column 2, line 52-64 of Carter.

Hence, the Carter reference fails to bridge the factual deficiencies of the Dziadosz reference, and accordingly, neither the Dziadosz nor the Carter reference, alone or in combination, teach or suggest each and every element recited in Claim 15.

The Dziadosz reference, in view of the Carter reference, fails to establish a *prima facie case* of obviousness with which to reject Claim 15. Neither the Dziadosz reference nor the Carter reference, alone or in combination, teach or suggest each and every element of the rejected Claims. Moreover because Carter teaches away from replication, there is no suggestion or motivation to combine the two references. Hence, Claim 15 is not obviated by Dziadosz or by Carter, alone or combination. Applicants therefore respectfully request the Examiner to reconsider and withdraw the rejection of Claim 15 under 35 U.S.C. §103.

VI. Rejection of Claims 26 and 30 under 35 U.S.C. §103(a)

Claims 26 and 30 stand rejected under U.S.C. §103(a) as being unpatentable over Dziadosz in view of Carter. Applicants respectfully traverse this rejection based on the following arguments.

Claims 26 and 30, depend, directly or indirectly, upon independent Claim 19 and, thereby, incorporate the novel features of Claim 19.

Claims 26 and 30 are not rendered unpatentable over Dziadosz in view of Carter. As discussed above, in connection with the rejection of Claim 19 under 35 U.S.C. 102, the Dziadosz patent does not disclose each and every element of Claim 19.

The Carter reference is not concerned with data replication. In fact, the Carter reference teaches away from data application. *See,* column 2, line 52-64 of Carter. Hence, the Carter reference fails to bridge the factual deficiencies of the Dziadosz reference, and accordingly, neither the Dziadosz nor the Carter reference, alone or in combination, teach or suggest each and every element recited in Claims 26 and 30.

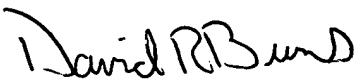
The Dziadosz reference, in view of the Carter reference, fails to establish a *prima facie* case of obviousness with which to reject Claims 26 and 30. Neither the Dziadosz reference nor the Carter reference, alone or in combination, teach or suggest each and every element of the rejected Claims. Moreover because Carter teaches away from

replication, there is no suggestion or motivation to combine the two references. Hence, Claims 26and 30 are not obviated by Dziadosz or by Carter, alone or combination. Applicants therefore respectfully request the Examiner to reconsider and withdraw the rejection of Claims 26 and 30 under 35 U.S.C. §103.

CONCLUSION

In view of the remarks set forth above, Applicants contend that Claims 1-30 presently pending in this application, are patentable, and in condition for allowance. If the Examiner deems there are any remaining issues, we invite the Examiner to call the undersigned at (617) 227-7400.

Respectfully submitted,
LAHIVE & COCKFIELD, LLP



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